DOCKET NO.: 243460US6YA

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF:
David L. O'MEARA, et al.

GROUP: 2823

SERIAL NO: 10/673,513

EXAMINER: COLEMAN, WILLIAM D

FILED: September 30, 2003

FOR: METHOD FOR MONITORING STATUS OF SYSTEM COMPONENTS

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a Notice of Appeal.

The review is requested for the reason(s) stated on the attached sheet(s). No more than five (5) pages are provided.

I am the attorney or agent of record.

Respectfully Submitted,

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DAVID L. O'MEARA, ET AL.	: EXAMINER: COLEMAN, WILLIAM D
SERIAL NO: 10/673,513	:
FILED: SEPTEMBER 30, 2003	: GROUP ART UNIT: 2823
FOR: METHOD FOR MONITORING STATUS OF SYSTEM COMPONENTS	:

Pre-Appeal Brief Conference Arguments

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

I. Summary of Embodiments:

Applicants' invention is directed to a method of monitoring the status of a system component in a batch processing system. As described in the background section of Applicants' specification, various parts of a processing system can include consumable or replaceable system components. Such components can be cleaned or replaced after detrimental processing conditions are detected, or according to a fixed time schedule. However, these maintenance approaches frequently result in overdue or premature cleaning or replacement of the consumable system components, resulting in degradation of process performance. Further, cleaning of the consumable parts and conditioning of the chamber having such parts is typically done for a fixed time period, which may be premature or unnecessarily long. Applicants' invention allows *in situ* monitoring of a system component in a batch type processing system in order to provide more accurate determination of maintenance and conditioning requirements.

For example, as shown in Figure 2a of Applicants' specification, light 223 from a light source is made incident on the system component 200, and light transmitted (221) and reflected (225) from the deposited film 210 is detected. As shown in Figure 2b, the transmitted light 222 and reflected light 226 changes intensity when the material deposit 210 is not present. This provides a mechanism for determining a state of the deposited layer based on threshold light intensities as shown in Figures 7a-7c.

II. The Cited References Do Not Teach or Suggest Monitoring a System Component

Applicants' Claim 1 reads as follows:

> Claim 1. A method of monitoring status of a ***system component*** in a process chamber of a batch type processing system, comprising:
> exposing a ***system component*** of the batch type processing system to light from a light source; and
> monitoring interaction of the light with the ***system component*** to monitor a state of a material deposit on the system component in order to determine a status of the ***system component***.

The Office Action cites U.S. Patent No. 6,762,849 to Rulkens as teaching all limitations of claim 1 except a batch processing system. Rulkens discloses a system for measuring the thickness of a film deposited on a substrate. As seen in Figure 5 of this reference, the process chamber 32 of Rulkens includes a radiation source 100 for injecting an optical signal into the process chamber. The optical signal is made incident on the substrate 20 and reflected from the substrate to be incident on the interior walls of the process chamber 32. According to Rulkens the interior walls of the process chamber have roughened surfaces that cause light reflected from the wafer to diffusely reflect off the chamber wall such that the light can be collected at a view port 40. The analysis tool 110 collects the light and detects a thickness of the film deposited on the substrate based on the collected light.

Thus, Rulkens discloses monitoring the thickness of a deposited film on a ***substrate***, and not monitoring the status of a ***system component*** as required by Claim 1 of the present

application. Indeed, Rulkens does not mention the problem of monitoring and maintaining system components at all.

The Office Action responds to this argument by stating,

> In response to Applicants contention that Rulkens in view of Fairbairn fails to tech a system component, ***the examiner takes the position that since the combined teachings describe forming a layer on a wafer with the wafer being a system component.*** Because the combined teachings teaches semiconductor manufacturing (column 1, lines 15-22 [of Rulkens]), ***it would highly suggest that wafer being a semiconductor component*** as defined by Applicant's disclosure. It is well known that a semiconductor wafer will be comprised of the claimed system components, i.e., quartz, silicon, alumina, carbon or silicon carbide (see column 9, lines 46-59 [of Rulkens]).

Thus, the Office Action takes the position that the semiconductor wafer being processed in Rulkens is a "system component" as claimed in claim 1.

However, it is well established that "[a]lthough the PTO must give claims their broadest reasonable interpretation, this interpretation must be consistent with the one those skilled in the art would reach.[1] Further, "[c]laims are not to be read in a vacuum, and while it is true they are given the broadest *reasonable* interpretation during prosecution, their terms still have to be given the meaning called for by the specification of which they form a part.[2] The outstanding Office Action does not meet this standard.

First, the above-quoted portion of the Office Action points to column 1, lines 15-22 and column 9, lines 46-59 of Rulkens to support its broad interpretation of a processing system component. However, the first of these citations to Rulkens merely mentions the term "semiconductor manufacturing." As to the second citation, this portion of Rulkens describes different types of films that may be deposited on a substrate within the processing system. These cited portions (and the remaining portions) of Rulkens simply do not support an

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[1] In re Cortright, 165 F.3d 1353, 1358, 49 USPQ 2d 1464, 1467 (Fed. Cir. 1999);
[2] In re Okuzawa, 537 F.2d 545, 548, 190 USPQ 464, 466 (CCPA 1976) citing In re Royka, 490 F.2d 981, 984, 180 USPQ 580, 582-83 (CCPA 1974) ("

interpretation of "system component" as including a substrate or wafer being processed within the system.

In addition, Applicants specification makes very clear that the "system component" is a component of the processing system, and does not include the wafer or substrate being processed. For example, Applicants specification reads as follows,

> [0041] ... The processing systems in FIGS. 1A and 1B have system components that can erode, can become coated with material deposits, or can have a material deposit removed during processing. ***Consumable system components include process tubes, shields, rings, baffles, liners, and other system components found in batch type processing systems.*** In one embodiment of the present invention, the system components can be manufactured from a variety of materials that are transparent to light. The consumable system components can, for example, contain ceramic materials such as oxides, (e.g., quartz (SiO_2) and alumina (Al_2O_3)), nitrides (e.g., silicon nitride (SiN)), carbides (e.g., silicon carbide (SiC)). A system component can be constructed from a single type of material or, alternately, it can be constructed from more than one type of material.
>
> [0042] ***Processing of substrates in a processing system can form a material deposit on the system component.*** A material deposit can contain one or more types of material, for example silicon (Si), silicon germanium (SiGe), silicon nitride (SiN), silicon dioxide (SiO_2), doped silicon, and dielectric materials including high-k metal oxides such as HfO_2, HfSiOx, ZrO_2, ZrSiOx. Monitoring etch products from the etching of many different material deposits can be unpractical due to a large number of etch products than can require monitoring.
>
> [0043] ***In one embodiment of the present invention, a processing system can include a system component having a protective coating. A protective coating can, for example, protect a consumable system component from the processing environment during a process, and increase the lifetime of the consumable system component.*** A protective coating can be deposited on a system component in-situ, for example during a chamber conditioning process, or, alternately, a protective coating can be predeposited on the system component during manufacturing of the system component. A protective coating can, for example, include SiN, SiC, SiO_2, Y_2O_3, Sc_2O_3, $Sc2F_3$, YF_3, La_2O_3, CeO_2, Eu_2O_3, DyO_3, SiO_2, MgO, Al_2O_3, ZnO, SnO_2, and In_2O_3.

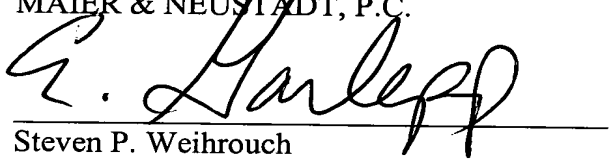
Applicants submit that at least these portions of the specification clearly contrast system components from the wafer being processed. Further, at no point does the

specification describe monitoring of the wafer itself. Thus, no reasonable interpretation of system component includes the wafer being processed.

The cited reference to Fairbairn et al. is cited only for its teaching of a batch processing system in general. This reference does not disclose any optical monitoring system, and thus cannot correct the deficiencies of Rulkens. Thus, Applicants' independent Claim 1 patentably defines over the cited references. As dependent Claims 2-38 depend from Claim 1, these claims also patentably define over the cited references.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



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